

Patent Claims

1. Device for receiving optical signals, comprising a light-guiding object into which the optical signal to be received may be coupled and which contains material having an electron array which may be inverted by energetic excitation and which, in response to stimulated emission, emits light at an emission wavelength which corresponds to the wavelength of the optical signals to be received,
- and comprising an excitation unit inducing the inversion, as well as a detector means optically coupled to said light-guiding object for the detection of the light which can be produced by emission processes stimulated by the optical signals coupled into said light-guiding object,
- characterised** in that said light-guiding object consists of a material, preferably a synthetic material, which, in response to light radiation at an angle of $0^\circ < \alpha \leq 90^\circ$ relative to the irradiation surface, produces light within the material by elastic dispersion – which means that the wavelength of the diffused light corresponds to the wavelength of the irradiated light – which has a radiation component in the direction of a main propagation sense of said light-guiding object.
2. Device according to Claim 1,
- characterised** in that said light-guiding object is a fibre optical waveguide in which one share of said elastically diffused light propagates along the fibre axis.
3. Device according to Claim 1 or 2,
- characterised** in that said excitation unit is an optical pumped light source.

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what array
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what way

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4. Device according to any of the Claims 2 to 3,
characterised in that an optical pumped light source and/or an element selective by wavelength is provided on at least one end of said fibre optical waveguide, which element filters the pumped light from the optical signals.
5. Application of the device according to the Claims 1 to 4 for optical signal transmission between two parts mobile relative to each other such that the optical signals emitted by an emitter unit are coupled into said light-guiding object.
6. Application according to Claim 5,
characterised in that said light-guiding object is disposed on a stationary element and said optical emitter means, which emits said optical signals, is arranged on a rotating element such that during one full turn of said rotating element the emitted optical signals may permanently be coupled into said light-guiding object.
7. Application of the device according to the Claims 1 to 4 as position-sensitive detector for light radiation by evaluation of signal transit times and/or signal amplitudes.
8. Application of the device according to the Claims 1 to 4 as orientation-sensitive detector for light radiation by evaluation of signal transit times and/or signal amplitudes.

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665050 "addition"